



FOREST PEST MANAGEMENT

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A BIOLOGICAL EVALUATION OF DWARF MISTLETOE AT ROUND VALLEY AND LITTLE CLEGHORN RESERVOIRS, SUSANVILLE DISTRICT, BUREAU OF LAND MANAGEMENT

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ABSTRACT

Two stands were examined in order to provide alternatives to reduce and prevent unacceptable losses to dwarf mistletoe on to Bureau of Land Management lands. Management alternatives available to reduce the impact of dwarf mistletoe, within current management restrictions, are provided and include 1) sanitation thinning; 2) pruning; and 3) prevention.

INTRODUCTION

On June 16, 1983 we examined two Bureau of Land Management stands, at Round Valley and Little Cleghorn Reservoirs near Eagle Lake, with Dan Marlatt, District Forester, Susanville District. The objective of the evaluation was to provide alternatives to reduce and prevent unacceptable losses to dwarf mistletoe.

OBSERVATIONS

Round Valley

The approximately 50-acre stand contains a sparsely stocked overstory of 200-year-old Jeffrey pine with a well-stocked understory of 70-year-old Jeffrey pine, incense-cedar and juniper. The stand is in BLM's timber production base and part of the allowable cut. Management restrictions include 1) use of the uneven-aged management system, and 2) management for eagle habitat, which involves leaving as many overstory trees as possible for eagle nesting purposes.

Western dwarf mistletoe (Arceuthobium campylopodum) was moderate to severe on overstory and understory pines throughout most of the stand. Annosus root disease, caused by Fomes annosus, was confirmed in Jeffrey pines in one area and suspected in others.

Young trees in portions of the stand had been marked for removal, with the intent to reduce basal area and to remove dwarf mistletoe-infected trees from the understory. Thinning began in late summer of 1982. Pockets of trees occurred where, even though thinning was heavy, trees infected with dwarf mistletoe in boles and upper crowns were left as potential crop trees. Some of these pockets of residual trees are exposed to a source of dwarf mistletoe infection from plants in nearby infected Jeffrey pines.

Pruning of individual infected branches in understory pines had also been done in an attempt to reduce dwarf mistletoe inoculum. A few pruned trees had dwarf mistletoe infections in the crown above the pruned branches.

Little Cleghorn

The 50-acre stand is similar to Round Valley in age and species composition and contains numerous pockets of overstory and understory Jeffrey pines with heavy dwarf mistletoe infection. Uneven-aged management, but not eagle habitat, restrictions apply. The management objective for the stand is to produce as much wood as possible.

Portions of the stand were thinned in 1980. Many of the leave trees are 8 to 11 inches dbh and, therefore, approaching merchantable size. Many of these same leave trees have dwarf mistletoe ratings of 5 and 6, and infections in the bole and in the upper crown. Pruning of infected branches, in an attempt to reduce levels of dwarf mistletoe on individual trees and thus enabling them to reach commercial size, is planned.

MANAGEMENT ALTERNATIVES

The uneven-aged management restrictions at both stands and the eagle habitat restriction at the Round Valley stand necessitate leaving dwarf-mistletoe-infected trees in the overstory. Management alternatives available to reduce the impact of dwarf mistletoe are further reduced because the composition of both stands is primarily Jeffrey pine, which is highly susceptible to western dwarf mistletoe. A discussion of the no action alternative, and alternatives available to reduce the impact of dwarf mistletoe in the two stands follow:

1. Continue Current Management Direction (No Action): This alternative includes postponing any action until some date in the future. Left untreated, the dwarf mistletoe will continue to intensify in the already - infected trees and spread to surrounding susceptible trees. Moderately infected trees have reduced growth rates. Heavily infected trees are under stress and have a high probability of dying when additional stress factors such as drought or overstocking occur that further

reduce tree vigor and increase the tree's susceptibility to successful bark beetle attack. Silvicultural systems that intermix generations of the susceptible host will favor the dwarf mistletoe infestation. Under the uneven-aged management silvicultural system, the future stand of Jeffrey pine will be exposed to the dwarf mistletoe - infested Jeffrey pine, infection of the new stand is assured, and future growth loss and tree mortality will result.

2. Sanitation Thinning: Thinnings are used to remove heavily infected trees, increase the growth rate of lightly to moderately infected trees, reduce stress from overstocking, and to favor non-host species. Thinning of infected stands will aid in maintaining optimum growth of residuals and reduce tree stress. Following release, lightly infected residual Jeffrey pine on more productive sites may vertically outgrow the dwarf mistletoe if infections are confined to the lower one-third of the crown. Noninfected trees should be favored as leave trees. The removal of all trees with dwarf mistletoe ratings of 5 and 6 should be considered, because these trees have a high probability of dying in the next 10 to 15 years.

Sanitation thinning is most likely to be beneficial in lightly infected stands approaching merchantable size. In pockets where numerous Jeffrey pine are moderately to heavily infected with dwarf mistletoe, sanitation through thinning might leave less than acceptable stocking levels and not meet the restrictions of uneven-aged management or management for eagle habitat. Leaving dwarf mistletoe-infected Jeffrey pine in the overstory to satisfy these restrictions will leave a source of inoculum for infection of Jeffrey pine in the understory. Poisoning or girdling of these overstory trees would kill the dwarf mistletoe and still leave a standing tree for eagle nesting. Therefore, if the trees are nearly merchantable, selecting, but deferring implementation of this action alternative, may be appropriate.

3. Pruning: Pruning of infected branches in an attempt to increase the vigor of individual trees or to reduce the amount of dwarf mistletoe seed available for spread is generally not recommended in commercial forests. Pruning of trees approaching merchantable size may increase tree growth rates if infections are confined to the lower two-thirds of the crown, but the cost involved may make the pruning uneconomical. Many of the potential crop trees at Little Cleghorn have dwarf mistletoe infections in the bole and in the upper one-third of the crown, making these trees unprunable.

Pruning to reduce the amount of inoculum is biologically questionable, primarily due to the presence of latent infections in the remaining tree crowns. Experience has shown that removing branches only up to the highest infection or even one more whorl almost always results in latent infections appearing in 3 to 5 years. Re-entry and additional pruning would need to be scheduled to remove these previously undetected latent infections. Furthermore, dwarf mistletoe plants in infected overstory trees will provide inoculum.

4. Prevention: Pockets of trees exist in both stands where dwarf mistletoe infection does not now occur. Protection of Jeffrey pines in these pockets from infestation would be a first step in long term reduction of dwarf mistletoe impact. Initially, the extent of dwarf mistletoe infestation should be determined by mapping the two stands. Areas found free of dwarf mistletoe could then be protected from adjacent infested stands by creating buffer strips around the uninfected areas.

If mapping indicates significant areas of dwarf mistletoe-free Jeffrey pines in the stand, it may be possible to remove the infested stand around the uninfested areas through a series of patch cuts. Over a period of time, the dwarf mistletoe-free, even-aged stand created by the patch cut could be converted to an uneven-aged stand through a series of intermediate cuts.

Other areas exist where current dwarf mistletoe infestation is light to moderate, and where other, resistant, tree species could be favored and still meet the management restrictions. The future impact of dwarf mistletoe in these areas can be minimized. First, infected merchantable overstory Jeffrey pines could be harvested, or killed and left standing if needed for eagle nesting, to eliminate the overstory source of infection. Remaining infected residual Jeffrey pines could then be removed while favoring other tree species. Because of latent infections, the treated areas should be re-examined no later than 10 years from the initial treatment and all visibly infected Jeffrey pine killed or removed.

OTHER PEST-SPECIFIC CONSIDERATIONS

Application of granular borax to freshly cut pine stumps created during thinning and other operations in the stands should be considered. Annosus root disease is present at the Round Valley site and is a common problem in other areas of the eastside pine type. The number of stumps infected by F. annosus ranges from 5 to 15% in the pure pine areas of the Lassen National Forest. Borax is toxic to the spores of F. annosus and is effective (90%) in preventing new infections.

Green pine slash generated by pruning or tree removal should be treated to reduce the risk of pine engraver (Ips spp.) buildup. Slash created in the spring or early summer should be lopped and scattered, piled and burned while green, clipped, or removed from the site.